

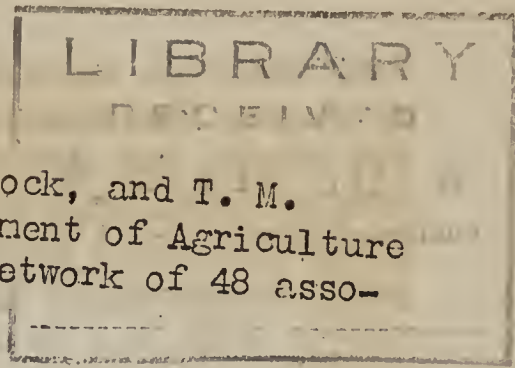
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THE GARDEN CALENDAR



A radio discussion by W. R. Beattie, Walter M. Peacock, and T. M. Whiteman, Bureau of Plant Industry, delivered in the Department of Agriculture period of the National Farm and Home Hour, broadcast by a network of 48 associate NBC radio stations, Tuesday, September 27, 1932.

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ANNOUNCER:

In our Garden Calendar period today W.R. Beattie, Walter M. Peacock, and T. M. Whiteman of the Bureau of Plant Industry are going to tell us about the results of experimental work that they have been doing to determine the best temperatures at which to store potatoes. I'll ask Beattie to lead the discussion.

BEATTIE:

OK Salisbury, and now folks you know how we are inclined to take a lot of things for granted. We do a great many things just in the way that our fathers or our grandfathers did, that is, until some one like Peacock or Whiteman, who are here with me today, come along and show us that we're wrong. So long as I can remember we horticulturists have been telling potato growers to store their potatoes at a temperature just a few degrees above freezing. Peacock, I believe you are the one who started the search for information on the best temperatures for storing potatoes. What prompted you to start these experiments?

PEACOCK:

Well, a few years ago, the potato chip manufacturers began to ask questions about where they could get their supplies of potatoes that would give them better quality when the potatoes were made into chips. I am connected with the potato production work of the Department while Whiteman here is in the storage end of the work, and I think he can tell you how we came to start the experiments.

BEATTIE:

How about it, Whiteman?

WHITEMAN:

As Peacock said, a lot of the manufacturers of potato products and restaurant managers were having trouble with the cooking quality of the potatoes that they were buying on the markets during the winter and early spring months. The potatoes that had been kept in storage were not proving satisfactory, and they were getting a lot of complaints from their customers.

PEACOCK:

That reminds me. One time when I was stopping in a southern city I ate at a restaurant where they served an excellent T-bone steak, but the French-fried potatoes that they served with the steak were very poor. Those French-fries were

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dark colored, almost burned, soggy and greasy. As I stopped at the desk to pay my check, the manager was at the cash register, and I told him how much I enjoyed the steak, but how much I did not enjoy the potatoes. He said that he knew the French fries were poor, but he explained that he used the best northern-grown Green Mountains that he could buy, and had them kept in cold storage at 35 degrees temperature until he wanted them for use. Right there I knew what was the matter with his potatoes. They had been kept at too low a temperature. We already had temperature-storage experiment tests underway with several varieties of potatoes. Whiteman can tell you how we conducted these tests.

WHITEMAN:

Well,-- we began by planting a fairly large number of definitely known varieties, because we wanted to study this storage matter from every angle. We made the storage tests on selected potatoes that were free from bruises, external injuries, and diseases. The potatoes that we selected were mature, of medium size, and of uniform quality at the time that they were stored. We divided them into different lots, and stored them at temperatures ranging from 32 degrees to 60 degrees Fahrenheit, or even higher in some cases.

BEATTIE:

Well, you know the old saying, "The proof of the pudding is in the eating." I suppose that after the potatoes had been in storage for a reasonable time, you cooked samples to test their quality?

PEACOCK:

Oh yes, we cooked good sized samples every thirty days. We tried them boiled, baked, French-fried, and also for making potato chips. The workers in the Bureau of Home Economics helped us make the cooking tests.

BEATTIE:

Well, what did the cooking tests show, Mr. Peacock?

PEACOCK:

We found that the potatoes stored at 32, 36, and 40 degrees Fahrenheit were watery, dark, and had an unpleasant sweet taste when boiled or baked. The potatoes stored at 50 and 60 degrees were creamy white, mealy and had a very pleasant potato flavor.

WHITEMAN:

Yes, and you remember the judges always picked the potatoes that were kept at the higher temperatures as having the best flavor. I could pick them out every time, even when I was blindfolded.

BEATTIE:

Peacock you told about the inferior French-fried potatoes in the restaurant. Did the potatoes that you kept at the higher temperature give you better French-fries?

PEACOCK:

Oh yes, the potatoes stored at 50 and 60 degrees gave us French-fries that were a golden yellow, mealy, and fine flavored. The potatoes stored at temperatures of 40 degrees or below produced French-fries that were dark brown in color, soggy, and greasy, and had an unnatural sweet taste.

WHITEMAN:

Yes, and you know the potatoes stored at 50 and 60 degrees produced excellent potato chips. They were golden yellow, crisp, and had a good flavor. The chips made from the potatoes stored at low temperatures were dark colored and had a burned taste. In fact, we found it impossible to make good potato chips from potatoes that had been stored for any length of time at temperatures below 50 degrees.

BEATTIE:

Didn't the potatoes sprout badly in the 50 and 60 degree storage?

WHITEMAN:

No, not within a reasonable period. For example, Irish Cobbler and Green Mountain, two of our most common commercial varieties, remained dormant about three months at 60 degrees, four months at 50 degrees, and six months at 40 degrees.

BEATTIE:

What about seed potatoes, Peacock, would you store them at a lower temperature than you would the table stock?

PEACOCK:

No, -- not unless you must in order to prevent excessive sprouting. We found that seed potatoes kept at 50 degrees or a little higher, gave us better yields, other things being equal, than those kept at 40 degrees or lower.

BEATTIE:

I suppose you base this conclusion on actual tests.

PEACOCK:

Yes, indeed, we selected good, sound seed potatoes, and stored them at the various temperatures, then we planted them, grew the crops, and recorded the yields.

WHITEMAN:

You know -- we got increases of 25 or 30 per cent in favor of the lots that were kept at the higher temperatures. Another thing, the seed potatoes that were kept at the higher temperatures came up quicker than the others.

BEATTIE:

That's interesting. Now, you fellows have been telling us about the effect of temperature on the cooking quality of stored potatoes, but you haven't told us the underlying cause of the difference in quality in favor of the higher storage temperatures. What is the cause Peacock?

PEACOCK:

Well, -- the main reason is that some of the starch in the potato turns to sugar at the lower storage temperatures. It is this increase of sugar in the potato that gives you a soggy, poor flavored potato when it is boiled, steamed, or baked. You also get a darkening of the color of the flesh of the potato during cooking.

You see, the bursting of the starch grains during cooking is what makes the potato nice and mealy, but if considerable of the starch has been changed to sugar on account of low storage temperatures, you simply can not get a nice mealy texture and creamy white color.

BEATTIE:

Mr. Whiteman, perhaps you will tell us what effect this change from starch to sugar in the potato has on the quality of French-fries?

WHITEMAN:

The potatoes kept at a low storage temperature make a very dark brown, soggy, heavy product. You see the French-fries are cooked in oil or fat and this oil or fat must be very hot in order to cook them. The high temperature cooking caramelizes the sugar and that gives you French-fries that are dark brown in color and have a burned taste.

BEATTIE:

Does the same thing happen when you attempt to make potato chips from potatoes stored at low temperatures?

WHITEMAN:

Yes it does. Potatoes stored at a temperature below 50 degrees for any length of time and then used directly from the storage, produce chips that are dark brown in color and have a burnt taste.

BEATTIE:

And what storage temperature gave you the best chips?

WHITEMAN:

We made our best chips from potatoes that were stored at temperatures of 60 to 70 degrees. They were light golden yellow, crisp and fine flavored.

BEATTIE:

Peacock you are on the growing end of this work, -- does the variety have anything to do with it.

PEACOCK:

Yes, considerable, but not nearly so much as storage temperatures. We tested five commercial varieties and while variety did make some difference the storage temperature was the main determining factor in the quality of the product.

BEATTIE:

There you are folks, the whole thing in a nutshell, only in this case it is the shell of a potato. This work with the storage temperatures of potatoes is another example of how science has pointed the way to better methods of producing, storing and preparing our foods. All right Mr. Salisbury.

